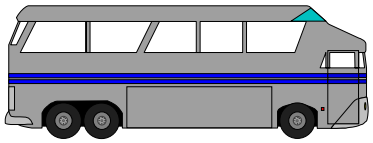
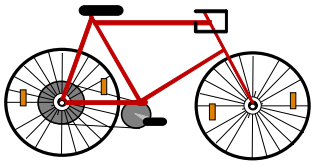
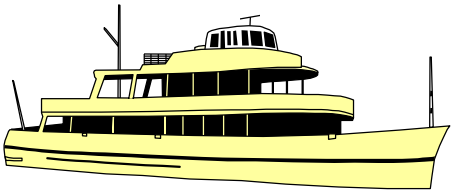
AN OVERVIEW OF KENTUCKY'S TRANSPORTATION SYSTEM







AN OVERVIEW OF KENTUCKY'S TRANSPORTATION SYSTEM

The Commonwealth of Kentucky has a diverse transportation system comprising airports, bicycle and pedestrian facilities, highways, public transportation, railroads, waterways, and intermodal facilities. Everyday this system is used to move people or freight from one location to another to enhance economic development and the quality of life in Kentucky.

This portion of the *Statewide Transportation Plan* will provide an overview of the various modes of Kentucky's transportation system. The purpose of this overview is to demonstrate the diversity of the transportation system and provide the general characteristics of each mode.

AIR TRANSPORTATION

Kentucky's air transportation system comprises five major airports and fifty-seven regional or city airports (Exhibit 10).

The five major air carrier airports are located in Boone County (Cincinnati/Northern Kentucky), Louisville, Lexington, Owensboro, and Paducah. These five airports offer regularly scheduled passenger and freight service. International flights are available at the Cincinnati/Northern Kentucky International Airport located in Boone County, the Louisville International Airport, and Blue Grass Field located in Lexington. Kentucky's airports vary in services, from those that offer a limited number of commuter flights to those that host hundreds of departing flights per day. Commuter services are only available at Owensboro and Paducah.

The two airports, which serve major hub operations, are the Cincinnati/Northern Kentucky and Louisville. DHL Worldwide Express and Delta maintain major hubs at the Cincinnati/Northern Kentucky International Airport, and United Parcel Service (UPS) operates its major international hub at the Louisville International Airport in Louisville. The annual service volumes of these major air carrier airports are indicated in Figure 4.1.

FIGURE 4.1

Annual Service Volumes of Major Commercial Airports		
Airport	Number of Passengers Boarding Planes (1998)	Pounds of Freight Handled (1998)
Cincinnati/No. Ky. International	21,500,000	8,000,000,000
Louisville	1,776,670	1,569,618,360
Lexington	541,636	5,908,607
Paducah	22,246	605,629
Owensboro	9,046	17,336

Source: Kentucky Transportation Cabinet, Division of Aeronautics

Fifty-seven regional or city airports complement the five major air carrier airports. Kentucky's general aviation airports provide services for business, government, and personal aircraft, and offer a variety of services. These airports can accommodate small to medium-size aircraft. Kentucky's airports and their proximity to the National Highway System in Kentucky are shown in Exhibit 11.

In 1997 the Kentucky Transportation Cabinet initiated an update of the Kentucky Aviation System Plan (KASP). The purpose of the plan was to:

- Inventory the public airports around the state.
- Summarize aviation trends and identify socio-economic factors that could affect aviation development.
- Prepare forecasts of general aviation activity and compile air carrier activity forecasts from existing information.
- Analyze the aviation system and determine development needs for the next 20 years.
- Examine the linkages of airports to other modes of ground transportation.
- Quantify the economic impacts of individual airports in terms of jobs and dollars.
- Quantify the total economic impact of all public airports combined in Kentucky.
- Communicate the study's results in easily understandable terms.

The KASP was finalized in February of 1998 and recommended airport development projects over a 20-year planning period. This study recommended standards for three levels of airports in Kentucky. These standards were based on the class of aircraft that would use the airport on a regular basis and the accepted Federal Aviation Administration (FAA) methods of

determining facilities for various types of airports. A list of project needs was developed to implement these three levels of airports. The specific project needs recommended to implement this three-level approach are included as Appendix A of this document for information purposes. However the entire Kentucky Aviation Systems Plan (KASP) Update for 1998 should be considered as included in the STP by reference.

Considering the current federal and state funding levels, this list of projects has not been approved for total funding, nor are ample funds anticipated at this time to fully implement the KASP plan. The Long-Range Plan is a financially-constrained document based on anticipated funding. Therefore, these projects are not included in the Short-Range or Long-Range Element of the current Plan.

The KASP divided the recommended airport development needs over the 20-year planning period into three stages. The short-range planning period (Stage 1) is 0-5 years. The intermediate planning period (Stage 2) is 6-10 years, and the long-range planning period (Stage 3) is 11-20 years. The recommended funding levels required to implement each of these stages has been included below.

- Stage 1 – 0 to 5 years $87,007,960
- Stage 2 – 6-10 years $135,170,940
- Stage 3 – 11-20 years $31,422,800

Total **$253,601,700**

It is important to note that these estimates do not represent approved funding levels in Kentucky, but are simply the results of the KASP recommendations of what it would take to bring Kentucky's Aviation System up to a sufficient level to provide good access for business, personal, and emergency needs across the state – in a phased approach as recommended in the KASP. Full implementation of the KASP will require action by the local airport owners/operators with assistance from both the State and Federal governments and the provision of additional funding.

The proposed enhanced Kentucky Aviation System in Kentucky, after the completion of all projects included in the 20-year plan, is shown in Exhibit 27, located in the "Presentation of Planned Improvements" Section of this document.

Kentucky is developing an Airport Capital Improvement Program for the first time, which will recommend improvements to Kentucky's airports over a six-year period. Funding for this plan will be based on anticipated Federal Aviation Administration funds, Kentucky appropriation of General Funds, and funding from the Kentucky Aviation Economic Development Fund approved by the 1998 Kentucky General Assembly. The available funding for the Air Transportation Program in Kentucky is presented in the Funding Section of this Plan.

BICYCLE AND PEDESTRIAN TRANSPORTATION

The bicycle and pedestrian transportation systems are concentrated largely in Kentucky's metropolitan areas. The bicycle transportation system is composed of shared roadways (bicycle and motorized vehicles share the roadways), bicycle lanes (a part of the roadway), and bicycle paths (separated from the roadway). The pedestrian transportation system is composed of sidewalks, pedestrian overpasses, pedestrian tunnels, and elevated walkways.

A Bicycle/Pedestrian Coordinator within the Transportation Cabinet coordinates all bicycle and pedestrian activities between the Cabinet, the Bicycle and Bikeway Commission, other state and local agencies, and the general public. A significant feature of the bicycle transportation system is the designation of a series of statewide bicycle routes (Exhibit 12). These mapped routes, which are shared roadway routes, will provide guidance for bicycle travel. The specific routes may vary slightly from year to year as travel conditions change, but the general corridors should remain the same. Kentucky's metropolitan areas, through their respective metropolitan transportation planning processes, have their own bicycle plans which should be referred to for guidance and more project specific data. Many regional and local planning agencies have also developed bicycle plans for some of the more rural and recreational areas of the state.

Kentucky has formulated a Statewide Bikeway Plan, which should be adopted in the near future. The bicycle and pedestrian planning effort also includes bicycle and pedestrian safety, educating motorists and bicyclists about the rules of the road, and promoting bicycling and walking as accepted forms of transportation.

HIGHWAY TRANSPORTATION

The highway system is the backbone of Kentucky's transportation system. The system comprises more than 73,033 miles of public roads and streets and provides access and mobility for millions of daily users. Nine interstate highways and nine state parkways combined provide about 1,412 miles of multi-lane limited-access highways. This integrated system of highways connects Kentucky with all major commercial centers in the eastern and central United States.

Of the more than 73,033 miles, approximately 45,700 miles are maintained by city and county governments, and the remaining 27,400 miles are state-maintained (1999 data). Exhibit 18 in the Water Transportation System Section also reflects the "Major Highway System" in Kentucky.

INSERT EXHIBIT 10

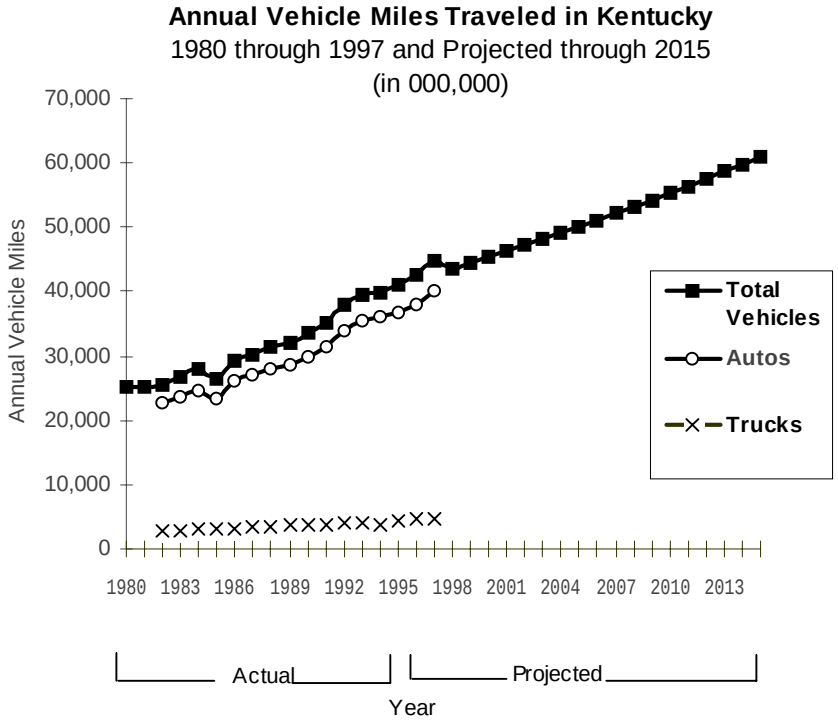
INSERT EXHIBIT 11

INSERT EXHIBIT 12

State-Maintained Highway System Service

The state-maintained highway system serves 122,915,000 vehicle miles of travel everyday or 44,864,000,000 vehicle miles of travel every year (based on 1997 data). We have seen an average increase in the annual vehicle miles of travel of approximately four percent per year over the last ten-year period from 1988-1998. This increase is due, in part, to the improved economy since 1993. The annual vehicle miles of travel have been projected through the year 2004 to increase at a continuing rate of approximately four percent a year, based on this ten-year average.

FIGURE 4.2



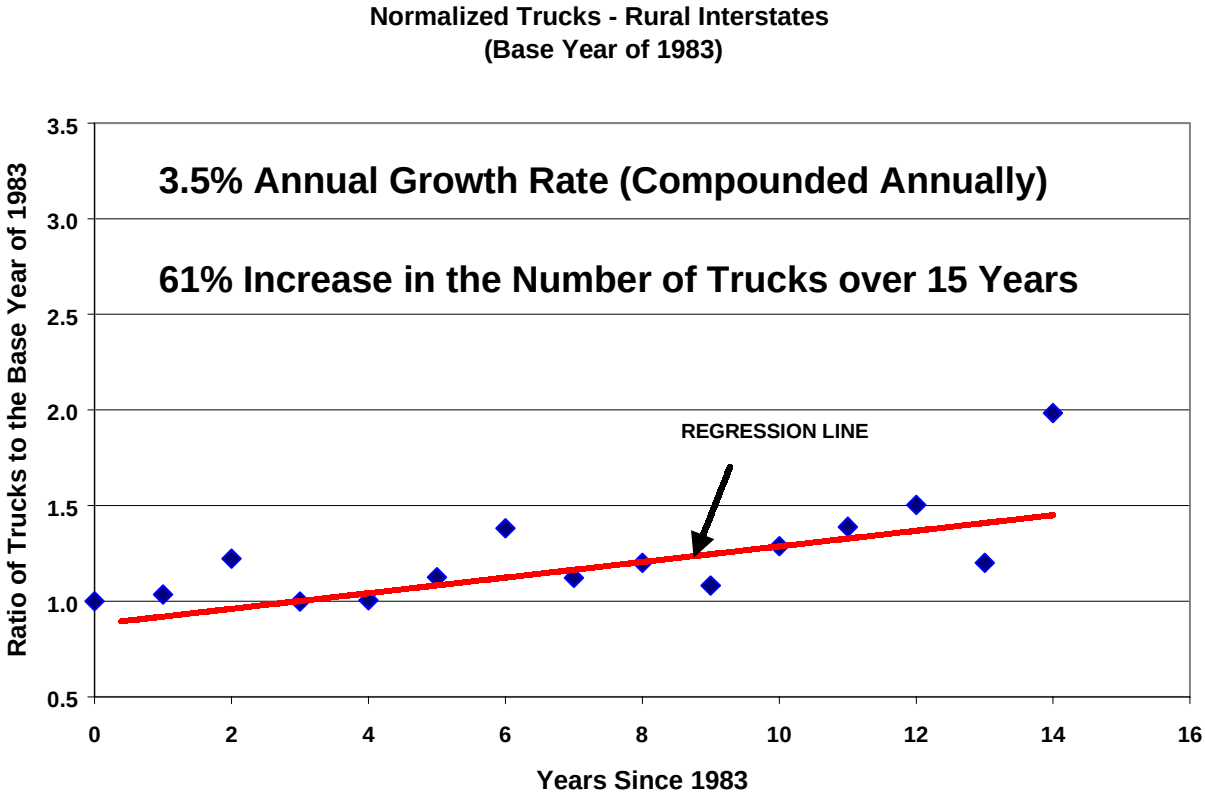
Source: Kentucky Transportation Cabinet, Division of Planning

The state-maintained highway system, which represents 37 percent of the total system length, serves 84 percent of the state's total daily vehicle miles of travel.

The state-maintained highway system serves 13,000,000 vehicle miles of travel by trucks everyday which represents 11 percent of the total daily vehicle miles of travel. However, we have seen a 3.5 percent annual growth rate in truck traffic on rural interstates in Kentucky, resulting in a total increase of 61 percent in the number of trucks travelling on Kentucky's rural interstates over the fifteen-year period from 1983 to 1998 (Figure 4.3).

FIGURE 4.3

Normalized Annual Average Daily Traffic (AADT)
Rural Interstates



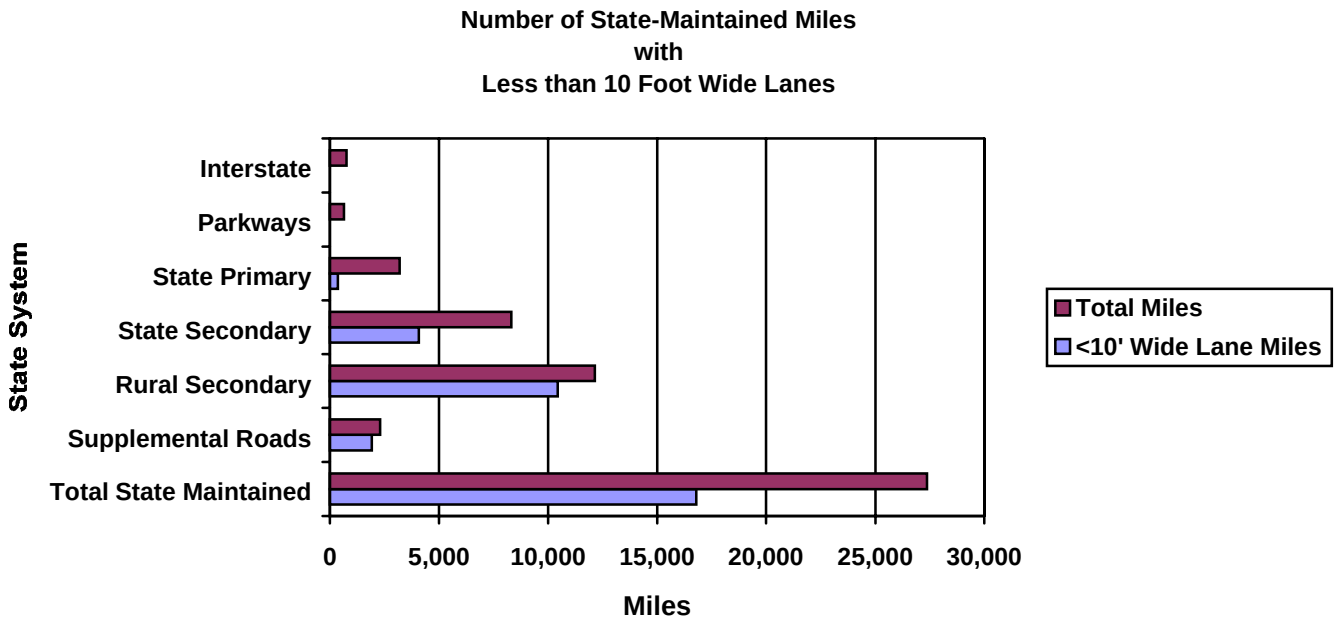
Source: Kentucky Transportation Cabinet, Office of Policy and Budget

As many as 51,000 freight carriers have been authorized to operate over Kentucky roads in the past two to three year period. However, the system serves approximately 40,000 freight carriers today, which represents the number of carriers that were authorized to operate in Kentucky in 1998. Most major trucking companies have end-of-the-line terminals in the state.

State-Maintained Highway System Condition

The 27,400 miles of the state-maintained highway system comprises approximately 59,800 lane-mil*es* of pavement and 8,800 bridges. In 1997, 61.38 percent of those state-maintained miles had lane widths of less than 10 feet. Figure 4.4 shows the distribution of those miles by state system. The Rural Secondary and State Secondary System roads have the greatest percentage of roads with lanes less than 10 feet in width (more than 80 percent); while the State Primary System has only 11.44 percent of mileage with lanes less than 10 feet wide.

FIGURE 4.4



Source: Kentucky Transportation Cabinet

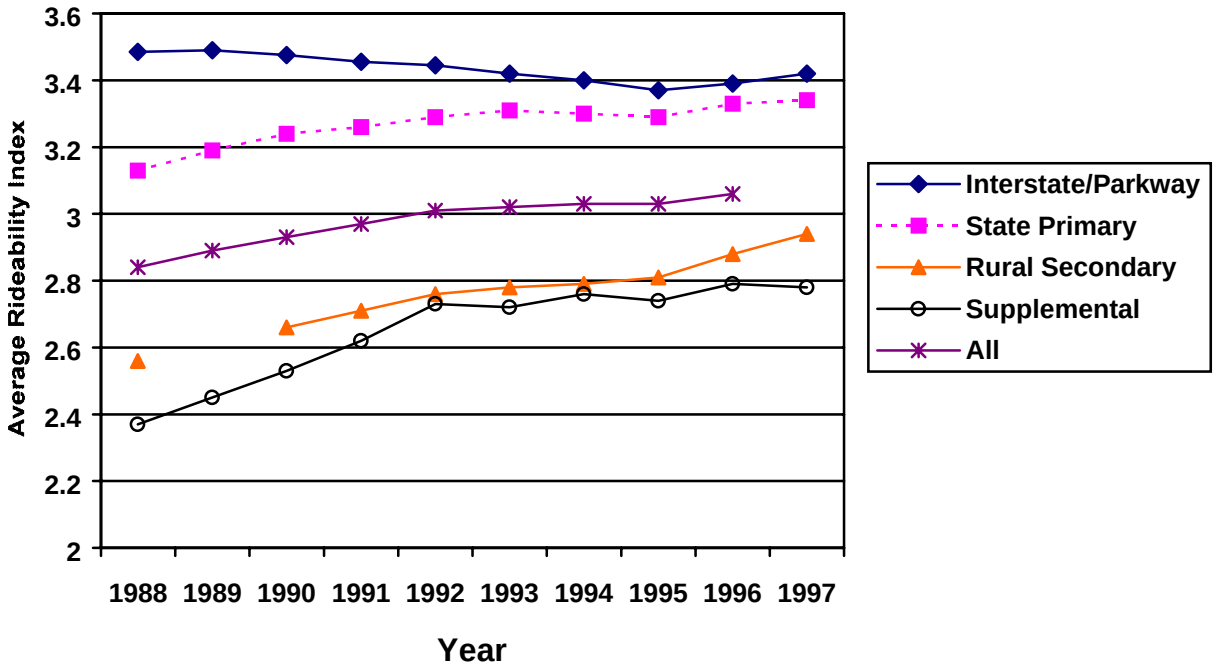
State-Maintained Highway System Performance

The performance of the state-maintained highway system can be measured in terms of the level of service provided to the users of that system. The Transportation Cabinet will be using four variables to determine changes, over time, in the level of service provided to system users. These variables include pavement rideability index, percentage of functionally obsolete and structurally deficient bridges, statewide accident rates and adequacy ratings.

As mentioned, the pavement rideability index (RI) is a general measure of pavement conditions. Over time, the change in rideability index for the state-maintained highway system gives an indication of the performance of the highway. The rideability index (RI) is based on a scale of 0 to 5. The following RI ranges are shown with a corresponding general condition: 0 to 1 is very poor, 1 to 2 is poor, 2 to 3 is fair, 3 to 4 is good, and 4 to 5 is very good. Pavement management data for 1997 indicates the average RI for all state-maintained pavements was 3.0 which is in the "good" category. The rideability index for all state-maintained roads has remained fairly constant since 1992, although there is a distinctive difference between the various state systems. The average rideability index by state system is shown in Figure 4.5.

FIGURE 4.5

Average Rideability Index
Kentucky State-Maintained Roads
1988 – 1997



Source: Kentucky Transportation Cabinet, Division of Operations

Figure 4.6 shows the median RI per vehicle-mile for the entire state-maintained highway system and the percent of pavements considered to be poor, fair, or good over an eleven-year period from 1987 through 1997.

FIGURE 4.6

Median and Average Pavement Rideability Index per Vehicle-Mile for the State-Maintained Highway System (1987-1997)

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Median RI	3.21	3.21	3.22	3.26	3.28	3.30	3.30	3.30	3.29	3.32	3.35
Average RI	2.75	2.77	2.82	2.87	2.91	2.96	2.97	2.97	2.97	3.02	3.05
% Good or Very Good Condition	48.5	49.9	54.0	56.0	58.7	61.5	62.0	60.7	61.6	64.5	66.1
% Fair Condition	35.1	34.7	32.7	31.7	30.4	29.0	27.5	29.9	28.2	24.9	23.1
% Poor or Very Poor Condition	16.4	15.4	13.3	11.5	10.9	9.5	10.5	9.4	10.2	10.6	10.8

Source: Kentucky Transportation Cabinet, Division of Operations

The percentage of ”very poor to poor” and “fair” condition pavements decreased consistently from 1987 through 1992. However, the percentage of roads falling into the poor or very poor condition began to slowly increase in 1993 through 1997. The percentage of roads falling into the “fair” category continued to decrease over the entire eleven-year period of time. The mileage of pavements in poor condition decreased from 2,115 miles in 1987 to 945 miles in 1992. The percentage of roads in the “good to very good” category has consistently increased throughout the entire period, while the percentage of “fair” roads increased through 1992, then began to fluctuate from year to year through 1997.

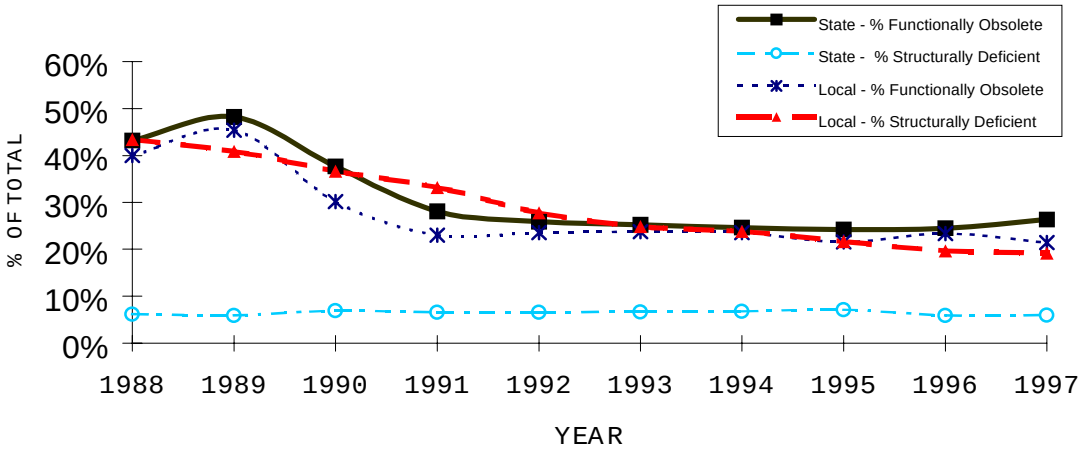
From 1987 to 1992, the Cabinet had resurfaced pavements on a 12 to 14 year cycle. In more recent years, the resurfacing cycle was 16 years or more because of greatly increased costs due to inclusion of pavement striping, ramps for sidewalk access, improved shoulders, and other requirements. The percentage of pavements in poor condition has reflected this change in resurfacing cycle. However, the average RI and the median RI for all state-maintained pavements have steadily increased over this period of time (since 1992) to a level of 3.05 and 3.35 respectively in 1997 for a “good” rating.

The percentage of functionally obsolete and structurally deficient bridges is a good general measure of bridge conditions. Over time, the change in these percentages for the bridges on the state-maintained highway system gives an indication of the level of service being provided to highway users. One measure of the condition of all bridges is the percentage of bridges which are functionally obsolete or structurally deficient: the lower the percentage the better.

Bridge maintenance data for 1997 indicates 26 percent of the bridges are functionally obsolete and 6 percent of the bridges are structurally deficient: a total of 2,837 bridges that are functionally obsolete and/or structurally deficient. The percentage of bridges that are structurally deficient has remained fairly constant over the nine-year period from 1988 to 1997. As Figure 4.7 illustrates, the percentage of bridges which were functionally obsolete decreased dramatically between 1989 and 1992, then remained fairly constant through 1996. In 1997 the latter group of bridges began to increase slightly.

Figure 4.8 shows the total number of bridges on the state-maintained highway system, the number and percentage of functionally obsolete bridges, and the number and percentage of structurally deficient bridges over an eleven-year period from 1987 through 1997.

FIGURE 4.7
Percent Functionally Obsolete and Structurally Deficient Bridges On State and Local Highways 1988 - 1997



Source: Kentucky Transportation Cabinet, Division of Operations

FIGURE 4.8

Statewide Number & Percentage of Functionally Obsolete and Structurally Deficient Bridges					
Year	Total Number of Bridges	Functionally Obsolete		Structurally Deficient	
		Number	Percent	Number	Percent
1997	8,768	2,309	26	528	6
1996	8,756	2,147	25	522	6
1995	8,721	2,114	24	623	7
1994	8,716	2,149	25	591	7
1993	8,711	2,198	25	580	7
1992	8,677	2,249	26	573	7
1991	8,650	2,432	28	573	7
1990	8,646	3,253	38	599	6
1989	8,598	4,141	48	508	6
1988	8,526	3,684	43	532	6
1987	8,273	4,018	49	521	6

Source: Kentucky Transportation Cabinet, Division of Operations

Due to changes in the National Bridge Inspection System (NBIS) criteria used to define bridges and their functional and structural deficiencies, the totals fluctuate from one year to another. A "structurally deficient bridge" is defined as a bridge posted below the weight carrying capacity of the road or inadequate to handle the legal trucking weights and are posted at reduced vehicle weight limits. A "functionally obsolete bridge" is defined as a bridge that merely compares design standards. It examines geometric design from the time the bridge was built to current standards. However, the general trends indicate the total number of state-maintained bridges has been increasing, while the percentage of functionally obsolete bridges decreased through 1995, but has remained constant through 1997. The percentage of structurally deficient bridges has essentially remained unchanged over the ten-year period.

Over time, the change in the statewide accident rate for the state-maintained highway system gives an indication of the performance of the highway system. The statewide accident rate is shown in terms of the number of accidents per 100 million vehicle miles of travel (100 MVM). Figure 4.9 shows the accident rate for fatal accidents, injury accidents, and all accidents over the ten-year period from 1988 through 1997.

FIGURE 4.9

Statewide Accident Rates

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Fatal Accidents Per 100 MVM	2.10	1.92	2.07	1.87	1.69	1.76	1.59	1.64	1.57	1.65
Injury Accidents Per 100 MVM	85	86	83	71	68	70	68	67	65	65
All Accidents per 100 MVM	288	289	273	226	216	222	217	214	215	215

Source: Kentucky Transportation Center, University of Kentucky

Only 69 percent of the total accidents on Kentucky roads occurred on state-maintained roads in 1997 while over 80 percent of the vehicle miles traveled are on these same roads. According to the Analysis of Traffic Accident Data in Kentucky (1993-1997), prepared by the Kentucky Transportation Center, University of Kentucky, the accident rate on the state-maintained system is dramatically less than on the non-state maintained system. The overall accident rate in 1997 was 215 accidents per 100 million vehicle-miles. This was very similar to the previous accident rates, although the 1997 number was down 0.9 percent from the previous four-year average.

The fatal accident rates also showed a general long-term trend of a decreasing fatal accident rate. While 1997 showed a very slight increase of 0.6 percent compared to the previous four-year average, this rate in 1996 was the lowest of the five years. The injury accident rate decreased by 3.7 percent in 1997 compared to the previous four-year average. This rate has remained fairly stable with the lowest rate of 65 in 1996 and 1997 compared to the maximum of 70 in 1993.

In summary, the statewide accident rate for fatal, injury, and all accidents has been on the decline over the past several years.

Another measure used to evaluate Kentucky's state highway needs is adequacy or sufficiency ratings. Adequacy ratings are rating techniques whereby the physical condition, safety, service, and efficiency of operation of a highway are assigned a numerical value. Using the Highway Performance Monitoring System (HPMS) Analytical Package, the elements of condition, safety, and service are rated separately and then added to produce a total rating called the Composite Index, which can range from zero to 100. The relative weights (numerical points) of each component (condition, safety, and service indices) in contributing to the composite index differ by functional system (interstate, principal arterial, minor arterial, collectors). The composite index ratings are categorized as follows:

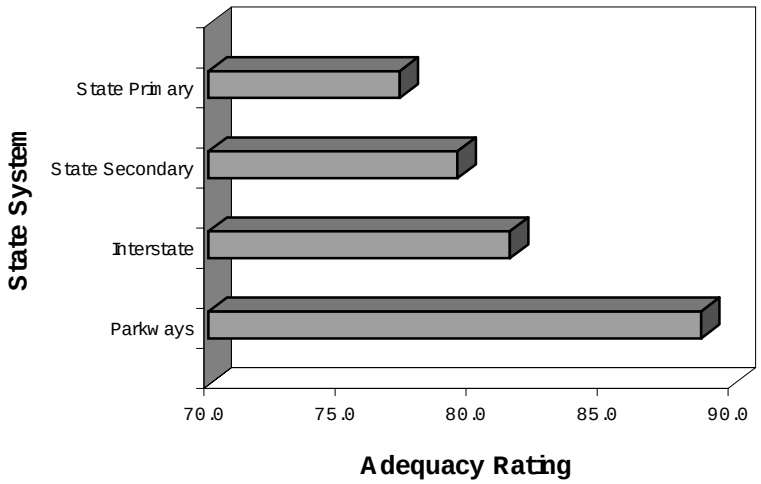
COMPOSITE INDEX RATINGS

- Very Good - 100 – 92
- Good - 91.9 – 85
- Fair - 84.9 – 75
- Poor - Less than 75

Figure 4.10 provides a picture of average percentages of Kentucky roads by state system which have poor, fair, good, and very good adequacy ratings. Forty-seven percent of the state system roads received an average adequacy rating of "fair." Twenty-five percent of the state system received an average rating of "poor"; twenty-four percent of the state system received an average rating of "good"; and only four percent of the system received an average adequacy rating of "very good."

FIGURE 4.10

Average Adequacy Ratings by State System
Kentucky
1997



Source: Kentucky Transportation Cabinet, Division of Planning

Based on the statewide accident rate, the pavement rideability index, the percentage of functionally obsolete and structurally deficient bridges, and the statewide adequacy ratings, the highway system performance has improved only slightly through 1997. However, if Kentucky is to continue to improve the highway system performance and continue to reflect an improving safety performance record, an increased emphasis must be placed on pavement condition and maintenance of existing roadways.

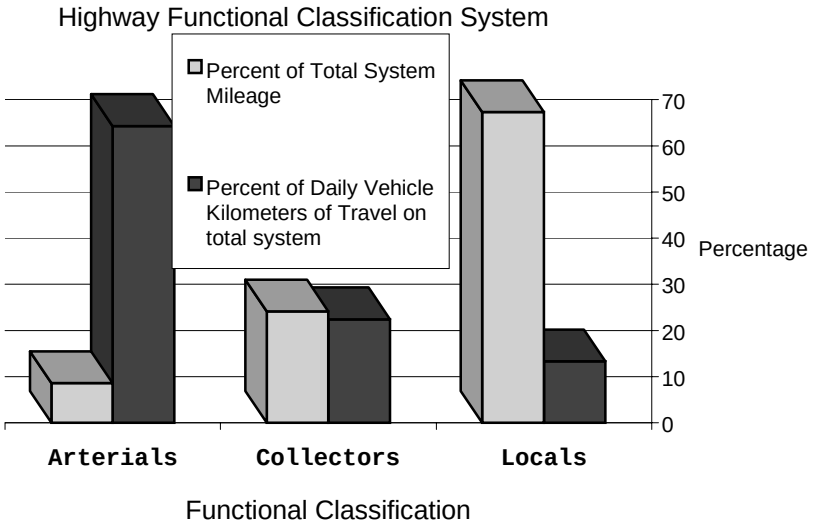
Functional Classification of the Highway System

There are three basic functional classification designations for highways: arterial, collector, and local. The arterial facility is used for mobility and connectivity. Its purpose is to provide a high level of service for a large movement of traffic from one major location to another such as a population center or business center. This large movement of traffic may be interstate, intrastate, or regional in nature. The collector facility is used for connectivity and access. Its purpose is to provide mobility and land access by collecting a medium amount of traffic from local highways and streets. This medium amount of traffic may be regional or local in nature. The local facility is used primarily for land access. Its purpose is to provide travel between homes and other adjacent land uses to the collector facility. This traffic is mostly local in nature.

In summary, the relative importance of a highway facility is established by its functional classification.

Figure 4.11 illustrates the relative size (length) and the daily vehicle miles of travel for each of the three basic functional classification designations in Kentucky.

FIGURE 4.11



Source: Kentucky Transportation Cabinet, Division of Planning

National Highway System (NHS)

Realizing the Interstate Highway System was essentially complete, Congress passed the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991 requiring development of a National Highway System (NHS). The National Highway System Designation Act of 1995 brought into being more than 160,000 miles of roads as the NHS. The NHS represents the backbone of our national transportation network for the 21st century. This system includes the Interstate Highway System and other principal arterials important to the nation's economy, defense, and mobility. It represents approximately four percent of the total public road mileage in the United States, yet accounts for approximately 43 percent of the vehicle-miles traveled. Kentucky has 2,834 miles on the NHS (Exhibit 13). This breaks down to approximately 2,245 miles of rural NHS and 589 miles of urban NHS.

INSERT EXHIBIT 13

ISTEA created the NHS and established federal highway funding categories and amounts based on the NHS and the functional classification system. The "Transportation Funding" section of the *Statewide Transportation Plan* will provide additional insight concerning the sources and amounts of funding available.

High Priority Corridors on the National Highway System

The TEA-21 identified numerous high priority projects across the United States that were considered to be a high priority from travel and economic development needs perspectives. Funding for these projects totals $9.3 billion nationally over the six years of the Act with a specified percentage of the project funds made available each year. Unlike high priority projects in the past, the funds for TEA-21 projects are subject to obligation limitation. Congress has directed, however, that annual obligation authority be expressly set aside for these projects. Many of the projects in Kentucky had already been included in the Six Year Highway Plan for 1999-2004 and two of the projects have been included in a planning study. The non-MPO high priority corridors in Kentucky listed in TEA-21 are as follows:

TEA-21 High Priority Corridors in Kentucky (Non-MPO)
Included in Six Year Highway Plan

Corridor Number	Description	Cost ($) in millions)
349	Widen US 27 from Norwood to Eubank	22.50
443	Reconstruct KY 210 from Hodgenville to Morning Star Road, Larue County	6.00
460	Construct Kentucky 31E from Bardstown to Salt River	0.75
464	Complete I-65 Upgrade from Elizabethtown to Tennessee State line	3.75
872	Construct US 127: $5,250,000 for the Albany Bypass from KY 696 to Clinton County High School and $3,161.25 for the segment between KY 696 and the Tennessee State Line	8.41
946	Construct US 127 Jamestown Bypass	4.35
1298	Construct KY 70 from Cave City to Mammoth Cave	1.50
1353	Reconstruct US 231: $5,625,000 for the segment between Dry Ridge Road and US 231 and US 31; $3,000,000 for the segment between Allen-Warren County Line and Dry Ridge Road	8.62
1578	Widen US 27 from Norwood to Eubank	5.83
1579	Reconstruct KY 210, Hodgenville to Morning Star Road in Larue County	2.00
1582	Construction on US 127: Albany Bypass to KY 90, Albany Bypass from KY 696 to Clinton County H.S. & from KY 696 to Tennessee State Line	2.81

Other TEA-21 High-Priority Corridors		
Corridor Number	Description	Cost ($) in millions)
111	Improve highway-rail grade crossings along the City Lead in Paducah	0.82
348	Correct rock hazard on US 127 in Russell County	0.03
376	Construct Route 259-101 from Brownsville to I-65	0.75
658	Construct Savage-Cedar Knob Bridge at Koger Creek	0.26
907	Construct a segment of the I-66 corridor from Somerset to I-75	11.25
1226	Conduct feasibility study for Northern Kentucky High Priority Corridor (I-74)	0.37
1580	Conduct feasibility study for Northern Kentucky high-priority corridor (I-74)	0.12
1583	Improve highway rail grade crossings along the City Lead in Paducah	0.25

Designated National Truck Network

The National Truck Network (NN) consists of roads which have been specifically designated for use by commercial motor vehicles (trucks) with increased dimensions (102 inches wide; 13 feet 6 inches high; semi-trailers up to 53 feet long; trailers 28 feet long - not to exceed two trailers per truck). The NN for Kentucky is approximately 3,436 miles. In Kentucky, motor vehicles with increased dimensions are allowed five driving miles on state-maintained highways (one mile on non-state maintained publicly-owned, public use highways) from the NN for the purpose of attaining reasonable access to terminals, facilities for food, fuel, repairs, or rest. Exhibit 14 shows Kentucky's Designated National Truck Network and the major roads within five miles of the NN.

INTELLIGENT TRANSPORTATION SYSTEMS

Kentucky has been significantly involved in the deployment of Intelligent Transportation Systems (ITS), a comprehensive national program of transportation technology development. At the core of ITS is the realization that transportation safety and capacity problems cannot be solved solely by new construction. Using new technology to more effectively manage existing systems, offers many benefits with lower costs.

Kentucky is nationally recognized as an early leader in the development and deployment of numerous ITS projects. Kentucky's initiatives have predominantly been through Commercial Vehicle Operations (CVO), Advanced Traffic Management Systems (ATMS), and Advanced Traveler Information Systems (ATIS). Significant progress has been made in the CVO area through the Advantage CVO Program and the Commercial Vehicle Information and Safety Network (CVISN), the Advantage CVO Mainline Automated Clearance system, which integrates weigh-in-motion (WIM) technologies, read-write electronic transponders, and high-speed networks to improve commercial vehicle operation on I-75. Further, this program - built around a partnership of five states, one Canadian province, and motor carrier industry representatives - demonstrates how public-private partnerships can be leveraged to deploy complex technology. The Advantage CVO Program is currently reorganizing to expand to at least 15 states and additional routes.

INSERT EXHIBIT 14

Kentucky is one of eight pilot states selected to incorporate and test commercial vehicle operation technologies as part of the specific plans being developed under Phase Two of CVISN by the U.S. Department of Transportation, the Federal Highway Administration, other state agencies, and the motor carrier industry. This pilot phase, which includes the development of CVISN administrative groups and field testing of hardware systems, is scheduled for completion in 1999.

Kentucky is also the Program Manager for the Advanced Regional Traffic Interactive Management and Information System (ARTIMIS) project in Northern Kentucky/Cincinnati. This project, which involves both ATIS (Advanced Traveler Information Systems) and ATMS (Advanced Traffic Management Systems), was completed in 1997 and is currently operational. ARTIMIS was designed to help minimize the time required to investigate and clear a crash site by coordinating communication with the various emergency response agencies and informing motorists of the crash ahead. ARTIMIS also provides a driver information system. Other ATMS and ATIS projects are operational in the Louisville and Lexington areas. In Louisville, the Traffic Response and Incident Management Assisting the River Cities (TRIMARC) system began operation in 1999 in the Louisville/Southern Indiana area, primarily on I-65 for a length of about ten miles. Expansion of the system will occur in 1999 with future expansion occurring in stages.

Kentucky has utilized ITS in several rural locations as well, specifically the Cumberland Gap Tunnel in Southeastern Kentucky, the Clays Ferry Bridge south of Lexington, and the Natcher Parkway/US 60 Bypass interchange near Owensboro. Kentucky has also deployed seven Road Weather Information Systems (RWIS) to enhance snow and ice operation.

Kentucky is currently undertaking the development of a Statewide Intelligent Transportation System Strategic Plan, including the development of a statewide ITS architecture. This work is being done in conjunction with the University of Kentucky Transportation Center. Such a Plan will eventually provide direction, strategies, uniformity and funding scenarios for the development of the state's ITS. This Plan should in turn assist the Cabinet in developing a project list for incorporation into the Long-Range Highway Plan process and eventually into the Six Year Highway Plan.

PUBLIC TRANSPORTATION

Kentucky's public transportation system has several components, which as a whole, provide statewide, comprehensive services. These components and the corresponding services are: (1) intercity and interstate buses which move passengers and freight, (2) rural public transportation vehicles which move passengers in the rural areas of the state, (3) public transportation vehicles for the elderly and disabled which meet the special needs of their users, (4) bus/transit systems in the cities which provide scheduled passenger service, and (5) transit planning in metropolitan areas.

Rural public transportation offers demand responsive, door-to-door service for users who live in the rural areas of Kentucky. In 1998, there were twenty-one agencies across the state that provided rural public transportation services (Exhibit 15). These twenty-one agencies served 1,471,000 passengers in 1998. The extent of rural public transportation service may be characterized by the fact that the 359 vehicles used to provide this service in 1998 were driven nearly 9.0 million miles and were utilized an average of 9.0 hours per day.

Public transportation for the elderly and disabled offers demand responsive, door-to-door service for elderly and disabled users across the state. In 1997, there were nineteen lead agencies that provided public transportation for the elderly and disabled through the services of over 150 other agencies throughout the state (Exhibit 15). These nineteen agencies served 1,789,000 passengers in 1997, operating 425 vehicles driving more than 7.6 million miles.

The bus/transit systems offer service to users who live in urban areas of the state. These systems operate in Frankfort, Henderson, Lexington, Louisville, Morehead, Northern Kentucky (Covington, and Newport), Owensboro, Paducah, and Ashland (Exhibit 15). These nine systems served in excess of 23,600,000 users in 1997.

In 1998 the Kentucky Legislature enacted House Bill 468 which combined the transportation responsibilities for Medicaid, Welfare, Workforce Development, Department for the Blind, and Mental Health under one program in the Transportation Cabinet. As a result of this legislation, Kentucky has initiated a regional coordinated human service transportation delivery program in an effort to coordinate the funding and the services of these various human service transportation systems throughout the state. The state was divided into 16 service regions as shown in Exhibit 16. The Cabinet contracts with a broker, who is selected by the Cabinet after an extensive application process. The broker then coordinates the transportation for each region and serves as a central contact point for obtaining transportation services. The broker provides this service through subcontracts with the private and public various transportation providers within the region such as: taxi companies, transit authorities, and community action agencies. During 1998 and 1999 six regions were selected to be included in the pilot program with all regions to be in operation by the close of CY 1999. Savings derived from this coordinated transportation delivery program are projected to exceed $12 million annually by the year 2002.

INSERT EXHIBIT 15

INSERT EXHIBIT 16

RAIL TRANSPORTATION

The rail transportation system in Kentucky is owned and operated by four major (Class 1) railroads, one regional railroad, ten local railroads, and two switching and terminal railroads (Exhibit 17). This system serves both commodity/freight and passenger movements.

The major railroads serving the state have connections with the major rail trunk line routes and major commercial centers in the nation. The major railroads operating in the state include CSX Transportation, Inc; Burlington Northern and Santa Fe Railway Company; Norfolk Southern Corporation; and Illinois Central Railroad.

The Paducah and Louisville Railway, a regional railroad, operates in Kentucky and has 329 miles of railroad in the state. Intermodal service is becoming increasingly important to many distributors and is now available at several facilities in Kentucky or adjacent to Kentucky in Cincinnati, Ohio and Evansville, Indiana:

- Norfolk Southern – Cincinnati, Ohio
- CSX Intermodal – Cincinnati, Ohio
- Norfolk Southern – Georgetown
- Norfolk Southern – Louisville
- CSX Intermodal – Evansville, Indiana
- Norfolk Southern – Shelbyville

The following 1997 figures provide service and performance information about the rail transportation system:

- Length of Railroad Track: 2,807 miles

Rail Type	No. of Freight Railroads	Miles of Railroad
Class 1	4	2,435
Regional	1	329
Local	10	192
Total	15	2,956

- Major Types of Commodities Handled and 1997 Tonnage:

Commodity	Tons Originated	Tons Terminated
Coal	107,272,701	20,910,797
Chemicals	2,352,848	3,228,000
Metallic ores	N/A	2,843,827
Primary metal products	2,720,872	1,572,592
Transportation Equipment	1,442,713	N/A
Waste and Scrap	N/A	1,769,660
Nonmetallic Minerals	991,252	N/A
Other	5,934,321	7,147,002
Total	120,714,707	37,471,878

- Railcars Handled: 4,083,646
- Total Tons Carried by Rail through Shipments: 295,054,307
- Number of Public Rail/Highway Crossings (statewide): 2,489 in 1997
- Number of Accidents at Public Rail/Highway Crossings are down 78.3 percent from 1994 to 1997:

  Statewide - 13 in 1997; 60 in 1994

As the above figures show, the rail system in Kentucky carries approximately 295 million tons while only originating 120.7 million tons. Only 37.5 million tons are terminated in Kentucky. The major reason for the difference between the total tons carried by rail and the tons terminated/originated in Kentucky is the large amount of rail shipments that travel <u>through</u> Kentucky to other parts of the country.

CSX and Norfolk Southern Railroad have jointly acquired Conrail, Inc. This joint acquisition should provide single-line service to New York and markets to the south through Kentucky. Full implementation is expected to bring more competitive rates, new business and new jobs to the rail industry and the regions served by both companies. The single-line routings are expected to cut transit times between Kentucky and New England by as much as one day and will open additional markets to Kentucky businesses – including finished vehicles and parts, coal and steel. With the increased delivery time, "through" shipments in Kentucky are expected to increase substantially.

Rail passenger movements by Amtrak are accommodated on track in northeastern and southwestern Kentucky (Exhibit 17). There are Amtrak stations in Fulton, Ashland, South Shore/South Portsmouth, and Maysville.

Amtrak currently operates two long-distance trains through Kentucky:

- The City of New Orleans – daily Chicago to New Orleans via Fulton Kentucky
- The Cardinal – three times weekly from Chicago to Cincinnati to Washington, D.C. via the Ashland area

During Fiscal Year 1997 Amtrak's ridership in Kentucky was as follows:

- Catlettsburg 2,574

(This station was relocated to a newly renovated facility in Ashland, Kentucky in March of 1998.)

- Fulton 2,362
- Maysville 1,345
- South Shore/South Portsmouth 1,620

Total Kentucky Ridership 7,330

Amtrak ridership in Kentucky has remained fairly constant in Fiscal Years 1996 and 1997, although down from 8,396 in 1995 and 8,470 in 1994.

Insert Exhibit 17

WATER TRANSPORTATION

Kentucky is second only to Alaska in the miles of navigable inland waterways in the United States used for commercial purposes and is ranked 11th in the nation for waterborne traffic. This extensive mileage of commercially navigable waterways provides an efficient means of transportation of bulk materials to inland markets and major ports on the Gulf of Mexico. Kentucky's 1,090-mile system of inland waterways is composed of portions of the Mississippi River, Ohio River, Cumberland River (Lake Barkley), Tennessee River (Kentucky Lake), Big Sandy River, Licking River, Kentucky River, and Green River (Exhibit 18). The Ohio River alone flows 664 miles along the northern border of Kentucky.

Barge shipments in Kentucky are primarily on the Mississippi, Ohio, and Green Rivers. Lesser amounts of freight are transported on the Cumberland, Tennessee, Big Sandy, Licking, and Kentucky Rivers. Principal commodities shipped on this waterway system are coal, corn, sand, gravel, crushed stone, crude petroleum, and raw materials such as steel, aluminum, lumber, and chemicals.

In 1995, the amount of commodities shipped out through Kentucky water ports was more than 153,000,000 tons, and the amount of commodities received through Kentucky water ports was nearly 56,000,000 tons. The major reason for the difference between commodities shipped and received is the large amounts of coal and aggregates that are shipped to other parts of the country and overseas.

Figure 4.12 shows the value of cargo transported via Kentucky waterways.

FIGURE 4.12

Value of Selected Cargo Transported Via Kentucky Waterways	
Commodity	Value ($ Million)
Coal, Lignite and Coke	1,642
Petroleum Products	753
Chemical Fertilizers	609
Chemicals	562
Food and Food Products	496
Sand and Gravel	88
Non-ferrous Ores	48
Iron Ore and Iron	27

INSERT EXHIBIT 18

According to the U.S. Army Corps of Engineers, Kentucky ranked fifth in the nation in domestic tonnage of waterborne commerce in 1998, with 89.6 million tons. Only Louisiana, Texas, Ohio, and Illinois ranked higher than Kentucky in domestic tonnage of waterborne traffic in 1998. The domestic tonnage in Kentucky increased 2.6 percent from 1997. Kentucky ranked 11th in total tonnage (domestic and foreign) in 1998.

The mining, manufacturing, agricultural, and water transportation industries in Kentucky employed more than 45,400 people and generated $311 million in state and federal payroll taxes during this same time period. Inland water transportation moves nearly $7.6 billion of cargo, provides more than 2,500 jobs, and produces nearly $19 million in state and federal income taxes each year.

Public Riverports and Private Terminals

Located along Kentucky's navigable waterways are many private and public terminals, which are used to transfer commodities/freight.

There are approximately 170 privately owned terminal facilities located on the waterway system. More than 30 of these terminal facilities provide transfer services "for contract." The remaining 140 terminal facilities provide transfer services only for the companies that own them.

There are also six public riverports, which provide land for industrial development, warehousing, and the transfer of commodities/freight. These six public riverports are located at Hickman (Fulton County), Paducah, Eddyville (Lyon County), Henderson, Owensboro, and Louisville (Exhibit 18). Activity at these six public riverports is indicated by the following figures for 1998:

Major Types of Bulk Commodities/Freight Handled

Aluminum	Aluminum Fluoride	Aggregates
Bridge Beams	Coal	Cookie Meal
Bulk and Liquid Fertilizers	Glass	Grain
Gravel	Machinery	Minerals
Mulch	Paper	Pet Coke
Sand	Sheet Pile	Slag
Solite	Stainless Steel Scrap	Hot/Cold Rolled Steel
Coil	Wire Rod Coils	Timber
Twine		

Annual Average Bulk Tonnage Handled	4,306,050
Annual Number of Trucks Loaded/Unloaded	122,300
Annual Number of Railcars Loaded/Unloaded	13,420

Activity over this same period for ALL Kentucky riverports (public and private) is indicated as follows:

Annual Bulk Tonnage Handled	27,818,000 tons
Annual Number of Trucks Loaded/Unloaded	185,000 trucks
Annual Number of Railcars Loaded/Unloaded	27,500 railcars

In 1998, the Kentucky General Assembly amended Kentucky statutes to shift the state government responsibility for public riverports from the Kentucky Cabinet for Economic Development to the Kentucky Transportation Cabinet (KYTC). This legislation authorizes the KYTC to "establish a developmental riverport authority." It also gives the KYTC responsibility for providing "oversight on development activities involving riverport authorities" and "for managing a study that will develop a long-range capital improvement plan for Kentucky's riverports." This study was completed in late 1999 and addressed capital needs for Kentucky's six public riverports, ground transportation access, economic impacts, and long-range funding mechanisms for riverports. The study identified total capital needs at Kentucky's public riverports of over $35 million. This study provided preliminary data on the needs of each of the public riverports in the areas of highway access, rail access, and capital needs. Additional study is required in this area to thoroughly determine the needs of the riverport system, funding possibilities, and the cost/benefits of water transportation in Kentucky.

Ferry Operations

Waterways are a natural transportation resource, but they also are natural barriers to highway travel. Highway travel in Kentucky is made easier by the thousands of bridges that carry vehicular traffic across waterways. However, there are some locations where there is not a bridge, and vehicular traffic is moved by a ferry. Ferry operations in Kentucky are both publicly and privately owned and can be found at the following locations:

- Valley View Ferry continues KY 169 across the Kentucky River in Fayette, Jessamine and Madison Counties
- Turkey Neck Bend Ferry continues KY 214 across the Cumberland River in Monroe County
- Rochester Ferry continues KY 369 across the Green River in Butler and Ohio Counties
- Green River Ferry and Houchins Ferry continue National Park Service roads across the Green River in Mammoth Cave National Park in Edmonson County
- Constance Ferry provides access across the Ohio River from KY 8 in Boone County, Kentucky to US 50 in Hamilton County, Ohio
- Augusta Ferry provides access across the Ohio River from KY 8 in Bracken County, Kentucky to US 52 in Brown County, Ohio

- Cave-In-Rock Ferry provides access across the Ohio River from KY 91 in Crittenden County, Kentucky to IL 1 in Hardin County, Illinois
- Hickman Ferry provides access across the Mississippi River from Hickman, Kentucky to Dorena, Missouri
- Aurora Ferry provides access across the Ohio River from KY 20 in Petersburg, Kentucky in Boone County to Aurora, Indiana

The locations of these ferry operations are shown on Exhibit 18.

INTERMODAL TRANSPORTATION

The phrase "intermodal transportation" means the movement of passengers or commodities using more than one mode of transportation for a specific trip that includes at least one intermediate transfer point. An example of an intermodal passenger trip would be driving a car to the airport, flying to a major city, and riding the train or a bus to the destination. An example of an intermodal commodity trip would be trucking coal from the mine to a railroad siding, loading and hauling the coal by rail to a riverport, and loading the coal onto a barge for a distant destination. Both of these movements would involve more than one mode of transportation for a specific trip that includes at least one intermediate transfer point.

Intermodal facilities, where two or more modes come together or interface, are becoming increasingly important in the overall efficiency of the total transportation system. Kentucky has numerous intermodal facilities that move people and goods between modes including:

- major rail/highway facilities in Georgetown, Shelbyville and Louisville where trailers and containers change modes
- coal transloading facilities
- airports
- intercity and interstate bus terminals/stations
- transit terminals and park and ride lots
- rail passenger stations
- riverports (public and private)
- ferry landings

All of these facilities have a common purpose: to provide the opportunity for people and freight to change modes in order to complete an intermodal trip. Kentucky's Major Intermodal Facilities are shown in Exhibit 19.

With many miles of navigable rivers and a fairly dense interchange between rail and highway in the coal regions, intermodal connections define a broad interface with the highway system. The Kentucky Transportation Cabinet has addressed this situation by including intermodal transportation as a special element in the Statewide Transportation Plan process.

Kentucky's approach to intermodal planning includes three primary emphases. The first draws on the knowledge and experience of Kentucky's intermodal community by employing an Intermodal Advisory Panel (IAP) to provide input on system-wide conditions and issues. The IAP produced an Intermodal Transportation Vision for the Commonwealth in 1997, wherein they identified broad-based strategies for improving the intermodal transportation system in Kentucky. These strategies were further strengthened through the development of seven issues which would help guide the Cabinet's goals and objectives for the statewide transportation planning process. These issues include:

- minimize environmental impacts of infrastructure development
- promote economic development through transportation infrastructure
- consider alternative mobility
- ensure public involvement and education
- encourage transportation priority management
- develop an optimal (safe and efficient) freight intermodal network
- require integrated land use and transportation planning

During 1998 the IAP combined the Intermodal Transportation Vision, these seven issues, and the mission of the Transportation Cabinet to provide input and direction to the goals and objectives of the Statewide Transportation Plan, and therefore the direction of the Long-Range Transportation Plan initiatives for Kentucky.

The second intermodal planning emphasis is a directed effort to understand and evaluate the day-to-day operational needs of the intermodal connections between highways and other modes, regardless of what or who is being transferred. This is facilitated by the development and implementation of performance measures specially designed for intermodal access routes. These measures will give an indication of congestion, delay, dimensional restriction, and safety along routes serving those facilities. Of the more than 700 intermodal facilities in Kentucky, approximately fifty major facilities are being closely evaluated for quality of access and need for improvements through a study conducted by the Kentucky Transportation Center. Results of this study will provide valuable data for consideration in formulating priority intermodal needs as part of the state's Six Year Highway Plan and Statewide Transportation Plan process. Exhibit 19 shows many of the facilities for which the access has been considered for additional performance measure data.

INSERT EXHIBIT 19

The third intermodal planning emphasis draws on the information inherent in the users of the system at the local level. KYTC and the Kentucky Transportation Center (KTC) produce an annual directory of facilities that is distributed to all facilities, both for their information and for verification. The information is also distributed to other agencies and businesses upon request. Additionally, KYTC and the KTC will soon implement an interactive map interface for those with Internet access. This will provide more immediate information and feedback about Kentucky's intermodal facilities as conditions change during the year.

These three approaches should provide Kentucky with detailed and macro-level information strategies to ensure continued effective operation of the Commonwealth's intermodal interface.